latest 6.3in8.5in-1cm0.7cm

document = =2.5cm=usual =0 October 29, 1997 **Math 108, Section 1, Test 2**

minipage[c]6in 1. Please cross $\times$ the correct answers.

[-2mm]0mm8mm Sign your name:6cm 6cm6=2.5in =0.8cm =1cm =0.4cm=1 Find the length of the vector $\vec{u} = (arrayc2$

6 36 2 4 10

Solve the following differential equation with given initial condition:

$$y' = 12y - 3, \ y(0) = 4.$$

$f(t) = 6 - 2e^{12t}$ $f(t) = 4 - 2e^{12t}$ $f(t) = 6 - 12e^{12t}$ $f(t) = 6 - e^{12t}$ $f(t) = 5 - e^{3t}$

Assume $y' = t^2$ and $y(0) = 1$. Compute $y(3)$.

10 3 9 0 12

Find the equation of the plane through the points $(8, 0, 0), (0, 4, 0)$ and $(0, 0, 2)$.

$x + 2y + 4z = 8$ $8x + 4y + 2z = 1$ $8x + 4y + 2z = 8$ $18x + 14y + 12z = 0$ $18x + 14y + 12z = 8$

For what value of k does the following system of equations have **no solution**.

$$arrayrcl4x - 14y = -17$$

$k = 21$ $k = -21$ $k = 27$ $k = 7$ $k = -7$

Solve the differential equation $y' = e^{t-y}$

$y = \ln(e^t + C)$ $y = e^t + C$ $y = e^{t-y} + C$ $y = e^{t-y} + e^t + C$ $y = \ln(e^t + t + C)$

Determine which of the following functions is a solution of the differential equation $y'' - 5y' + 6y = 0$.

e^{3t} e^{4t} e^{5t} e^{6t} e^{-5t}

Find the equation of the plane which passes through the point $P = (1, 1, 1)$ and which is perpendicular to the line $(arraycx$

$6x - 14y + 10z = 2$ $x + y + z = 1$ $5x - 6y + 2z = 1$ $3x - 7y + 5z = 0$ $5x - 6y + 2z = 0$

(5 pts) Find the constant solutions for the differential equation $y' = y^2 - 9$.

*4cm

(10 pts) In the following graph draw the constant solutions and sketch the solutions having initial condition $y(0) = 1$ and $y(0) = 4$.

(15 pts) A person opens an Individual Retirement account (IRA) with the initial amount of $40,000. Then $12,000 per year are deposited in this IRA in a uniform and continuous manner. Assume that the interest rate is 7.5% compounded continuously.

(5 pts) Model this problem as a Calculus problem by finding a **differential equation** and an **initial condition** describing the amount of money, $M(t)$, in the IRA at any time t.

*4cm

(5 pts) Solve the obtained differential equation, i.e. find $M(t)$ at any time t.

*8cm

(5 pts) Compute the balance in the IRA after 20 years. (If you do not have a calculator you can approximate $e^{1.5}$ with 4.5).

*5cm

(14 pts) Find the complete solution of the following system of linear equations. If no solution exists state this.

$arrayccccccccc2x - 2y + z = 4$